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VOLUME XIX

NUMBER 8

SPECIAL FEATURES

DOUGLAS MAIL PLANE

FULL SCALE WIND TUNNEL

COMMERCIAL AIRPLANE RELIABILITY TOUR

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The Air Taxi

WHEN the airplane began to be used for civil purposes after the war, there were various opinions as to the uses to which it would be put. One of these uses is for charter for specific flights or, in other words, as an air taxi. During the seven years that commercial aviation has been establishing itself, the use of airplanes for essential taxi work has been steadily increasing. Hardly a week passes without reading of some one being enabled to keep some extremely important appointment through use of the airplane.

This use of the airplane has been one of the most important in this country, and it has not been neglected abroad. Alan Cobham of the DeHaviland company has made some very remarkable flights, around Europe and to Africa and Asia. The Curtiss Exhibition Co. and the Checker Air Service in San Francisco, to mention only two, have been very successful in this kind of passenger carrying. The approximate rate for taxi work appears to be about fifty cents a mile.

The future will surely show an increase in this type of air work. Even when the country is crisscrossed with airways, there will still be a demand for air taxis. There will always be people who will feel that the time tables do not suit their convenience and will want to travel in a plane that will start when they are ready. There also will always be places where the airlines do not stop regularly but can be reached by taxiplanes. The pioneers in this work deserve the encouragement of all who have the future of aviation at heart.

Civilian and Military Developments

THERE is no more controversial subject than the relation of civilian aeronautics to military aeronautics. Many consider that commercial aviation will be the backbone of our military aeronautics. Others, greatly disturbed by what they consider gross exaggeration claim that civilian aviation will develop along divergent and separate lines and will have little direct bearing on military matters. The more tempered opinion believes that civilian aeronautics will bear the same relation to the military as the general industrial resources of a country bear to its military strength. In other words the aeronautic industry which has hitherto depended almost solely on military appropriations will gradually wean itself away from its dependance. The resulting growth of the industry will not be directly proportional to the increase in the strength of our military aeronautical resources.

There is a growing divergence between military and civilian types of planes. In the early days anything that would fly was considered satisfactory for army use, but progress has developed specialized types, and the specifications for military and commercial use are constantly growing further apart. There is every indication that our designers' ability to develop specialized types will increase and it is also a certainty that from the operation of both civilian and military types we will learn the use and necessity of machines adapted to the work they are to perform.

With personnel, especially pilots, there will also be a growing divergence. Planes are becoming constantly easier to fly. In the early days anyone who could fly was considered a superman but planes have become so much easier to control that piloting is becoming almost an incidental part of either commercial and civilian flying. The military flier will need an ever increasing knowledge of tactics and formation flying while the civilian pilots will have entirely different problems to solve.

We can thus vision a not far distant future where military and civilian aviation will be widely separated and where the differentiation will be as great as that between the farmer who drives a tractor and the soldier who operates a tank. The civilian development will become more and more emancipated from the military but the resources developed will be extremly important to the military branches although not identical in form and use.

The Reliability Tour

ONE of the necessary qualifications for a commercial carrier is reliability. Speed and comfort mean little to a business man if he is not sure that he will arrive at his destination on time. The extensive preparations and delayed starts of some of the more spectacular flights have created a wrong impression with the public. These widely advertised events do not furnish a true index of the airplane's reliability. The operations of the U. S. Air Mail give ample proof that the airplane is reliable if properly handled.

The public does not see the mail planes leave and depart nor are they told about their regularity in the newspapers. In order to bring airplane reliability before the public, Edsel Ford has donated a trophy for an annual commercial airplane reliability tour. This tour was suggested by the S.A.E. and is sanctioned by the N.A.A. The regulations are to be modified from year to year as experience dictates.

This year the regulations are based on an average speed, between controls, of eighty miles per hour. Twelve entries have already been received. The route covers a large part of the middle west and includes most of the large cities in the region. There can be no doubt that the arrival and departure of nearly a score of purely commercial machines at the various control points will convince a large number of people that the airplane is reliable today and that it does not require another decade of development to become a worthwhile, reliable, commercial vehicle.

Commercial Airplane Reliability Tour

Rules for the Award of the Ford Trophy Donated by Edsel Ford

Some time ago, the Society of Automotive Engineers conducted a survey to determine the desirability and nature of a reliability tour, similar to the Glidden tours for automobiles. A questionnaire was sent out to all who might be interested. The answers were digested and a booklet prepared giving the consensus of the opinions received.

The next step was for some aeronautical organization to take over the active management of the event. This has been done by the Detroit Aviation Society. They have decided to hold the tour, Sept. 28 to Oct. 3. The following organizations will cooperate with the sponsors; Society of Automotive Engineers, Detroit Board of Commerce, Detroit Flying Club and the Detroit Air Board. The general chairman for the tour is William A. Mara. Other officials are: Howard F. Werhle, general manager; Charles T. Bush, finance; Harold H. Emmons, program; R. W. Schroeder, field arrangements; E. LeRoy Pelletier, publicity; Ralph H. Upson, rules.

Exhibit

There will be a three day exhibit at the Ford Airport in connection with the tour. In order to provide some more spectacular events for the public, there will be a balloon contest for prizes donated by the *Detroit News*, jumping balloons, exhibitions of night flying by members of the First Pursuit Group and by planes from McCook Field, etc.

The following planes have already entered the tour; three Travel Air, two Laird Swallows, a Fokker with A. H. G. Fokker as pilot, a Junkers, a Curtiss, a Wright, a Waco, an Alexander Eagle Rock and a Stout All-Metal Monoplane.

Edsel Ford has donated a trophy for this event and the following is the deed of gift and the conditions for the 1925 contest.

Provisions of Deeed of Gift.

(Extract)

(a) The Ford Trophy, donated by Edsel B. Ford, shall be competed for annually by commercial airplane manufacturers. Entrants must show to the satisfaction of the Contest Committee that they are bona fide manufacturers.

(b) Each annual contest shall be in the nature of a cross country tour from city to city and shall be conducted over a course and under such rules as may be prepared from time to time by the Contest Committee of the National Aeronautic Association.

(c) The trophy shall be awarded each year, except the first, to the entrant of the winning machine who shall be entitled to possession of the trophy until one month prior to the next succeeding contest at which time the trophy shall be returned to the N.A.A. A suitable bond for its proper care and return shall be required by the N.A.A. from each and every person or organization into whose possession the trophy shall at any time be delivered.

(d) Each airplane finishing the first year's Tour within the requirements will entitle the names of its entrants and pilot to be engraved upon the trophy and will count as one leg toward the permanent possession of the trophy.

(e) Any manufacturer winning the trophy five times in succession will receive it as his permanent property.

Conditions of Contest for 1925

1 *General Requirements.*

(a) In order to stimulate interest among civilian constructors and civilian pilots, Army and Navy owned Planes will not compete in this tour.

(b) Airplanes entered for the Ford Trophy shall be capable of a speed greater than 80 m.p.h. as loaded for the Tour.

The Contest Committee may at their discretion, require any plane to qualify by flying four times, twice in each direction over a measured coarse to prove an air speed greater than 80 m.p.h.

(c) Factor of safety of wing cellule as loaded for start of race.

The Ford Airport where the Reliability Tour will start and finish

4 for low incidence conditions
8 for high incidence conditions

The above figures are subject to change for individual cases on judgment of the Contest Committee to meet proven good practise for planes of varying gross weight and special characteristics.

(d) All airplanes shall be constructed to seat comfortably a pilot and at least one passenger, or in lieu of passenger facilities, a suitable cargo space of not less than 8 cu. ft. shall be available for stowage of pay load.

(e) All planes shall be required to carry in addition to the pilot, a "pay" load of 0.5 lb. per cu. in. of engine displacement, which can consist of passengers, inert and useless ballast, or both. Tools, spare parts and cockpit covers may be included as contest load when properly sealed or marked.

Ballast load shall be sealed in place at start of the Tour and seals shall be inspected at each control station and on return to point of departure to insure that no part of the contest load was removed for any reason whatsoever; tools, spare parts, and cockpit covers excepted.

Space shall be provided for "pay" load equal to at least 0.05 cu. ft. per lb. of the load above specified.

(f) The pilot will be required to sign the official time sheet at each control station and shall in turn receive the official timer's signature and proper entries on his log of flight.

Prizes

2 *Prizes.*

(a) Each pilot actually starting, who completes at least one leg of the Tour shall receive an expense allowance of $100.00 (One Hundred Dollars). This will be handed to him, or his designated representative, at the first control station to help in defraying his subsequent expenses on the Tour.

(b) Each pilot completing the entire Tour within the requirements here specified shall receive, in addition, a prize of $250.00 (Two Hunderd and Fifty Dollars.)

The prizes will be paid to the pilot of each winning airplane, or his duly authorized agent.

Agreements in writing between pilots and entrants presented to the Contest Committee prior to the Tour or within 24 hr. after the finish of the Tour, will be upheld.

It will be the responsibility of each entrant receiving an expense allowence, or prize, to give general advice on the formulation of rules for the succeeding year's Tour when so requested by the Contest Committee, it being an object to make the rules for the succeeding years partake more of the character of a contest.

3 *Schedule of Stops* (Subject to change at the discretion of the Contest Committee):

Leg	*Date*	*Between Control Stations*
1	Sept. 28	Detroit to Fort Wayne
2	Sept. 29	Fort Wayne to Chicago
3	Sept. 29	Chicago to Omaha via Iowa City
4	Sept. 30	Omaha to St. Joseph
5	Sept. 30	St. Joseph to Kansas City
6	Oct. 1	Kansas City to St. Louis
7	Oct. 2	St. Louis to Indianapolis
8	Oct. 2	Indianapolis to Columbus
9	Oct. 3	Columbus to Cleveland
10	Oct. 3	Cleveland to Detroit

5 *Rules of the Tour.*

(a) All pilots shall taxi and fly on the same predetermined course and shall not cross or attempt to cross in front of another plane during take-off or landing.

(b) A plane overtaken in the air shall hold its altitude and true course.

(c) On landing, the plane shall taxi from landing area immediately and report to official checker.

8 *Time Requirements.*

The pilot of each contesting plane will be provided with a schedule which will show the time of departure from the arrival at each control station, based on a speed of 80 mi./hr.

A perfect score shall be earned when each leg of the course shall have been flown in a time not to exceed 50 per cent more than the scheduled time, providing at least 70 per cent of the legs are flown in a time not to exceed 30 per cent above the scheduled time.

7 *Finish Time.*

The time will be taken at each control station at the moment when the plane flies over a prearranged marker. The pilot may then make his actual landing to suit his convenience and that of other pilots who may be in process of landing.

8 *Winners.*

The winners of this Tour for 1925 shall include all of those who finish the entire course within the requirements herein specified.

9 *Qualifications.*

No pilot may take part in this Tour who does not possess the Federation Aeronautique Internationale Aviator's Certificate and annual license. Certificates and annual licenses must be shown to control officials on demand.

Applications for entry will be considered only when accompanied by a deposit fee of $100.00 (One Hundred Dollars). This will be returned to each entrant who has his plane on the starting line ready to go at the appointed time.

Manufacturers are at liberty to enter from one to three planes, each being considered as a separate entry.

10 *Disqualifications.*

Any contestant breaking the rules of the Tour or any subsequent decisions as to the interpretation which may be sent out in writing or posted by the Contest Committee at headquarters on the field, shall, upon recommendation of the judges, be disqualified.

Any pilot found physically unfit during or immediately previous to the Tour will be excluded from further participation. This shall be interpreted to include any who partake of alcoholics in any form.

Any machine which, in the judgment of the Contest Committee, is unsafe for commercial flying may be ruled out.

11. *Protests.*

No protest shall be considered unless presented in writing to the Contest Committee within twenty-four hours after the finish of the Tour. (1925 F.A.I. Rules 78, 79, 80, 81, 82, 83, 84, 85). (Appeals, see 1925 F.A.I. Rules, Art. 171, 172, 173, 174, 175, 176, 177, 178.)

12 *Numbers.*

Each plane shall have a number assigned to it by the Contest Committee, which shall be painted on the bottom surface of the lower wing and on each side of the fuselage, clear of the wing in characters as large and clear as possible. It shall not have other numbers or lettering over twelve inches in height.

Numbers shall be assigned in the order entries are received. The plane numbers assigned shall designate the order of start and correspond to number of minutes after the time designated on the schedule the airplane is due to depart from and arrive at control stations. Example: Airplane No. 10 will leave and arrive at control stations 10 min. after the times outlined in the schedule.

13. *Number of Contestants.*

Minimum number of contestants: Four.

Maximum number of contestants: Thirty-six.

The question has been raised that the rules for the Commercial Airplane Reliability Tour do not explain clearly the matter of what shall constitute a perfect score.

The rule reads: "The pilot of each contesting plane will be provided with a schedule which will show the time of departure and arrival at each control station, based on a speed of 80 mi./hr."

"A perfect score shall be earned when each leg of the course shall have been flown in a time not to exceed 50 per cent more than the scheduled time, providing at least 70 per cent of the legs are flown in a time not to exceed 30 per cent above the scheduled time."

Rule 6 is to be interpreted as indicated in the following example:

EXAMPLE

Leg—Blank to Blank City—Distance 80 mi.

Scheduled Time	*Standard Time*	*Maximum Time Allowed*
At 80 mi./hr.	(70% of the legs must be flown in a time not to exceed this schedule.)	30% of the legs must be flown in a time not to exceed this schedule.)
1 hr.	1 hr. 18 min.	1 hr. 30 min.

Aerial Map of the World

By A. P. BEREJKOFF

Radio Engineer of General Electric Co.

The map reproduced herewith in miniature (reduced from a drawing 5 ft. in diameter) is an adaptation of this type of projection for the representation of the whole surface of the globe. It has been specially constructed for the use of radio engineers of the General Electric Co. in connection with the regular operation of the radio broadcasting station WGY and for the interpretation of transmission tests of various nature conducted from time to time. It has Schenectady for its center and the circle enclosing the map is equal in diameter to the length of the circumference of the earth drawn to a definite scale.

Owing to the fact that our earth is a spheroid, it is not possible to accurately represent its surface on a plane except in cases when areas of such small dimensions are considered that the curvature of the globe within their bounds can be wholly neglected.

When larger areas are to be shown on a map, or a map of the whole world is to be produced, it becomes necessary to take recourse to some special method of representation where the unavoidable distortion is subjected to some definite law, so that by the proper application of that law, the distances between different points, areas, directions, etc. can be established with facility for any point desired.

Various Projections

Numerous methods have been developed for this purpose and are commonly known under the name of "projections" of different types.

Depending on the application for which the map is intended, it is generally most useful to utilize some particular type of projection. So, for instance, for the construction of nautical maps and navigators' charts the "Mercator's projection" is universally employed. On a map based on this projection, the course of a vessel which intersects the successive meridians at a constant angle is represented by a straight line. Thus the plotting of a course from day to day during the progress of a voyage is greatly facilitated, and the true distance of the point of destination can be easily determined.

Another advantageous feature of this projection lies in the fact that the plotting of different points, when their latitude and longitude are known, is extremely simple, because the meridians and the parallels are straight lines intersecting each other at right angles. But if a general idea of delineations of different continents, their relative sizes and respective positions with regard to each other, is to be gained, the so-called "polyconic" projection will be found more useful because of greater similarity between the figures on the surface of the earth to the corresponding figures on the projection. In one form or other, this projection is the one most frequently used in drawing maps of hemispheres, continents and large countries.

Not Aeronautical

These two projections are the two principal ones employed at the present time for general purposes and they are well known to everyone. Neither one of them, however, possesses the special characteristics which are necessary to satisfy the requirements of an aeronautical map.

It is not convenient to use any map constructed in either one of the two projections mentioned, because the distances between the points cannot be determined by direct scaling, due to non-uniformity of scale for different portions of the map, and because the straight line routes are not represented by straight lines on such maps. The result is that no correct idea as to the intervening territory or the bearing from the starting point can be readily had.

A map constructed in what is technically known as the "equidistant zenithal projection" with the point where the transmitting station is located selected as the center, provides means of obtaining answers to the above questions with utmost ease. This type of projection is ordinarily used to show only comparatively small areas of the surface of the earth, and is usually never employed for representation of larger portions of the globe, because the distortion in delineation of the areas considerably removed from the center is very prominent. A fairly complete analysis of this projection is included in the Encyclopedia Brittanica under "Maps."

Distortion not Serious

The distortion of the continents, particularly striking in the case of Australia, does not detract from the usefulness of the map for the purposes for which it has been constructed. The map is used as follows: the straight line distance between Schenectady and any other point is determined by direct scaling of the distance between the center of the map and the place selected using the scale given at the bottom of the map for the purpose. The radius drawn through that point is the projection of the great circle of the globe passing through Schenectady and the receiving station in question. It represents the true path of any flight. Moreover, since the scale along the radius is uniform, the exact ratio of distances over the land and the sea can be readily established by applying the same scale to the different portions of the route.

Finally, to obtain the bearing from Schenectady to any place desired, the straight line passing through these two points is extended until it intersects the outer graduated circle. This gives directly the bearing with respect to the Schenectady meridian expressed in degrees.

The first step in constructing such a map is to build the network of the parallels and the meridians as they appear in this type of projection with reference to the given point as a center. This network can be produced by calculation, but this is rather an extended laborious process, involving computation of coordinates of a multitude of points by means of spherical trigonometry. Results which for practical purposes are equally good can be more readily obtained if a graphical method of construction utilizing the principles of descriptive geometry is applied.

Special Features

It is interesting to study the shape of the meridians and the parallels on the network of this map.

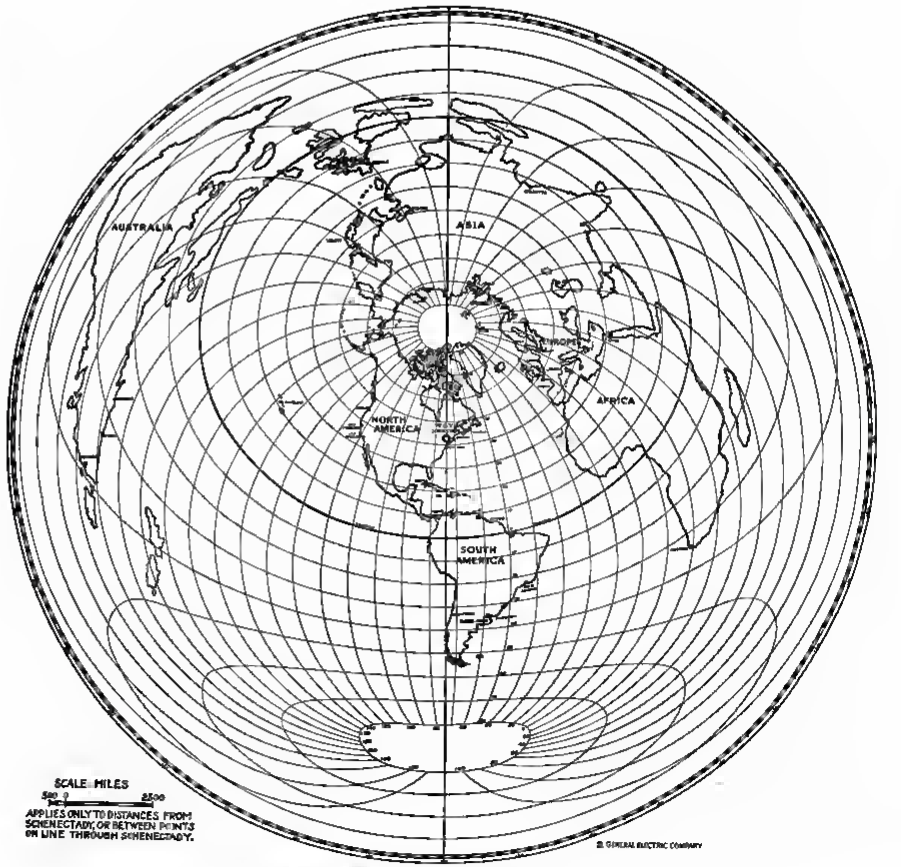
Since all of the great circles of the globe passing through the center are straight lines, the Schenectady meridian is represented on the map by the vertical diameter. The equator shown in a heavier line appears in a form of a curve enclosing the North Pole as do all of the parallels down to about 40°S. All of the parallels below this one close themselves around the South Pole. This of course is due to the fact that Schenectady has been chosen as the center of projection on this particular map. The shape of the curves is determined by the principle of projection in accordance with which the scale in the radial direction is uniform whereas the scale in the direction perpendicular to the radii is increasing with the distance from the center. Therefore the distortion of different figures on the map grows greater and greater as the distance from the center grows until the antipodes is reached, where the distortion becomes the greatest. Here a single mathematical point of the earth's surface is represented by the whole circumference of the circle around the map.

Inertia Factors of Ellipsoids for Use in Airship Designs

This report is based on a study made by L. B. Tuckerman as a member of the Special Committee on Design of Army Semirigid Airship RS-1 appointed by the National Advisory Committee for Aeronautics.

The increasing interest in airships has made the problem of the potential flow of a fluid about an ellipsoid of considerable practical importance. In 1833 George Green, in discussing the effect of the surrounding medium upon the period of a pendulum, derived three elliptic integrals, in terms of which practically all the characteristics of this type of motion can be expressed. The theory of this type of motion is very fully given by Horace Lamb in his "Hydrodynamics," and applications to the theory of airships by many other writers. Tables of inertia coefficients derived from these integrals are available for the most important special cases. These tables are adequate for most purposes, but occasionally it is desirable to know the values of these integrals in other cases where tabulated values are not available. For this reason it seemed worth while to assemble a collection of formulae which would enable them to be computed directly from standard tables of elliptic integrals, circular and hyperbolic functions, and logarithms without the need of intermediate transformations. Some of the formulae for special cases (elliptic cylinder, prolate spheroid, oblate spheroid, etc.) have been published before, but the general forms and some special cases have not been found in previous publications.

Report No. 210 may be obtained upon request from the N.A.C.A., Washington, D. C.



An equidistant zenithal projection with Schenectady as the center

The Douglas Air Mail Plane

A Commercial Type of Fine Performance Developed from Douglas Corps Observation Plane

It was to be expected that the Douglas Company, in response to the Air Mail invitation to American designers for a modern type of mail plane, would produce a machine good to look at and one which would equal or exceed the performance specified by the Air Mail

This expectation has been met by the company in the new mail plane with Liberty 12 engine designed by Donald W. Douglas. The plane has been tested officially by the Post Office Department with the result that in three important characteristics it exceeded in performance the tentative specifications. The pay load was increased from 800-900 lb to 1,000 lb, the service ceiling from 17,000 ft to 17,500 ft, and the landing speed decreased from 55 to 52 mi/hr.

Front view of the Douglas mail plane showing the thickened wing roots for the fuel tanks and the tunnel radiator

In the new mail plane advantage was taken of the experience gained in producing the Douglas XO corps observation. A feature of this plane is that an open cockpit seating four passengers may be provided in the two bays at the rear of the engine section, thus making a ship for fast passenger transportation work or taxi service. While the range, as a mail plane, is 700 mi. with standard wing tank installation provision has been made for increasing it to 900 mi. by installing a 40 gal. reserve tank in the first bay to the rear of the engine

The main dimensions, constructional features, performance and weights of the Douglas mail plane are:

Dimensions

Area upper wings excluding ailerons	188 sq. ft.
Area lower wings excluding ailerons	175 sq. ft.
Area four ailerons	50 sq. ft.
Area total	411 sq. ft.
Area stabilizer	48 sq. ft.
Area elevator	36 sq. ft.
Area rudder	10.35 sq. ft.
Area fin	7 sq. ft.
Chord	82 in.
Gap	72 in.
Incidence angle top and bottom	0 deg.
Dihedral angle top and bottom	2 deg.
Length of fuselage	25 ft.
Width of fuselage	30 in.
Height of fuselage	43 in.
Gas tank capacity	130 gal.
Motor	Liberty 12
Wing section	Clark Y
Mail compartment 30 x 43 x 78 in.	58.5 cu. ft.

Construction

Fuselage—The fuselage is made in two detachable sections—engine center section and rear section. The engine section is of chrome molybdenum steel tube construction.

The rear section is of chrome molybdenum steel tubing and carbon steel tubing. Welding and brazing are used on steel parts.

Wings.—The wings are of standard wood beam and built up rib construction. The upper section is made in two panels hinged at the center in such a manner as to make the beams continuous.

The lower section is made in two panels hinged at the stub wing which is built up integral with the fuselage. The leading edges top and bottom are covered with veneer.

Tail Surfaces—The vertical fin and horizontal stabilizer are of standard wood beam and built up rib construction. The elevators and rudder are made of duralumin tubing.

Chassis.—Axles and struts are of chrome molybdenum steel tubing streamlined with wood. Shock absorber consists of rubber shock absorber cord. The shock absorber system is built up and faired into the struts on inner side of the wheel. The tread is very wide thus making for stability and ease in landing. Tread is 8 ft. 6 in.

Tail Skid—The tail skid is of steel tubing and so constructed that it moves with the rudder while maneuvering on the ground.

Gas Tanks—The gas tanks are made of sheet aluminum and are mounted in the lower wing which is expanded to a streamline section to give proper capacity. They are so hung in the wing that they may be dropped at will by the pilot. A 10 gal. gravity tank is located in the upper right wing.

Cooling System.—The radiator is of "U" shape, cartridge type construction mounted well back from the nose under the engine in such a manner as to insure sufficient cooling. The shutters are of flat type construction so arranged that when the shutters are closed they form a streamline section with the nose of the fuselage.

Unit Stresses—The unit stresses are in accordance with those specified by the U. S. Army Air Service. Factor of safety—8.

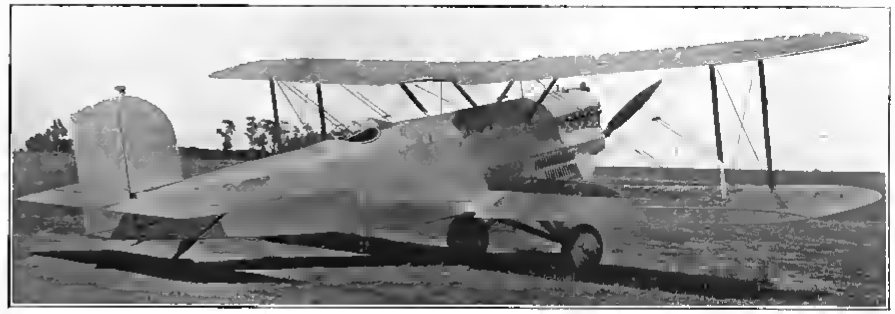
Cargo Space.—55 cu. ft. in the 1st and 2nd bays in rear of engine section.

12 cu. ft. additional in 3rd bay under pilot's floor.

Size of front compartment is 2½ x 3½ x 6 ft.

Performance and Weights

Total weight of plane loaded	4300 lb.
Useful load (inc. 720 lb. gas)	1800 lb.
Gas capacity	130 gal. (normal)
Gas capacity	170 gal. (with auxiliary tank.)
Passenger capacity	4 and pilot
Pay load (exclusive of pilot)	1000 lb.
Engine	1 Liberty 12
Wing area	411 sq. ft.
Wing loading	10.5 lb./sq. ft.
Max. speed	143 mi./hr.
Minimum speed	52 mi./hr.
Cruising speed	125 mi./hr.
Range—approximately	700 mi. with standard wing tank installation
Max. ceiling (full load)	17,500 ft.



Half rear view of the Douglas mail plane

The Effect of Changes in Compression Ratio upon Engine Performance

N.A.C.A. Report No. 205

This report, by Stanwood W. Sparrow, is based upon engine tests made at the Bureau of Standards during 1920, 1921, 1922 and 1923 and has been prepared for publication by the National Advisory Committee for Aeronautics. The majority of these tests were of aviation engines and were made in the altitude laboratory. For a small portion of the work a single cylinder experimental engine was used. This, however, was operated only at sea level pressures.

The report shows that an increase in brake horsepower and a decrease in the pounds of fuel used per brake horsepower hour usually results from an increase in compression ratio. This holds true at least up to the highest ratio investigated, 14 to 1, provided there is no serious preignition or detonation at any ratio. To avoid preignition and detonation when employing high compression ratios it is often necessary to use some fuel other than gasoline. It has been found that the consumption of some of these fuels in pounds per brake horsepower hour is so much greater than the consumption of gasoline that it offsets the decrease derived from the use of the high compression ratio. The changes in indicated thermal efficiency with changes in compression ratio are in close agreement with what would be anticipated from a consideration of the air cycle efficiencies at the various ratios. In so far as these tests are concerned there is no evidence that a change in compression ratio produces an appreciable consistent change in friction horsepower, volumetric efficiency, or in the range of fuel-air ratios over which the engine can operate. The ratio between the heat loss to the jacket water and the heat converted into brake horsepower or indicated horsepower decreases with increase in compression ratio.

A copy of Report No. 205 may be obtained upon request from the National Advisory Committee for Aeronautics, Washington, D. C.

Wright Cyclone Engine Flight Tested

The largest air-cooled airplane engine that has been produced in this country was flown from Paterson, N. J., to Washington, D. C., in a Navy torpedo plane on April 29. The 230 mi. covered by the flight was made in what is considered to be remarkably fast time for a heavy duty plane. Lieut. Lee Webb of the Bureau of Aeronautics, Navy Department, who piloted the plane landed at that Naval Air Station in Washington 1 hr. 50 min. after leaving Paterson. The engine installed in the plane is the first of its type to be built for the Navy by the Wright Aeronautical Corp. It is the 450 hp. "Cyclone."

Tests of the plane with the new air-cooled engine have indicated a marked increase in efficiency and performance. This fact is attributed to the decrease in weight per horsepower through the development of the air-cooled principle. The advantages of the air-cooled engine have been recognized for several years in aeronautical circles but the practical difficulties in building power plants in units of relatively large horsepower has hitherto proved a considerable difficulty. A comparison with the Liberty engine gives an accurate impression of the advance that has been made in the air-cooled "Cyclone." Whereas the Liberty installation involves a weight of 3.2 lb./hp. when ready for flight the new Wright "Cyclone" cuts this weight factor to 2 lb./hp., a saving in weight of nearly 40 per cent. Other advantages for the air-cooled engine in military types of aircraft are found in the elimination of the water cooling system which renders the plane more vulnerable to enemy attack. A puncture of the radiator system in combat will effectually eliminate a plane from action and bring it down.

In tests at the Paterson plant of the Wright Co. the plane indicated superior performance characteristics. It climbed for altitude at the rate of 1000 ft./min., took off with a very short run in 8 sec. and landed under control with a greatly reduced landing speed.

The importance of weight saving in aircraft engines is illustrated by the fact that the improved engines make available an enormous reserve of power in light planes such as fighters. This gives the fighting plane the advantages of ability to climb rapidly in altitude and maneuver under this reserve of power.

New Flying Records Recognized

New speed records with useful load made on June 16 at Bergen, Netherlands, by pilot B. Grasse flying a Fokker D-XIII, with Napier Lion 450 hp. engine, have been recognized by the F.A.I., according to word received by the National Aeronautic Association. The official marks follow:

CLASS C—Airplanes

With useful load of 500 kg. (1102.31 lb.)

Speed for 100 km. 266.627 km./hr. 165.673 mi./hr.
Speed for 200 km. 265.076 km./hr. 164.710 mi./hr.

With useful load of 250 kg. (551.15 lb.)

Speed for 100 km. 266.627 km./hr. 165.673 mi./hr.
Speed for 200 km. 265.076 km./hr. 164.710 mi./hr.

Full Scale Wind Tunnel

By E R DAWLEY

Asst Prof of Applied Mechanics Kansas State Agricultural College

The wind tunnel of the Kansas State Agricultural College is, so far as now known, the only one of its kind in the world While the tunnel was designed primarily for determining the aerodynamic resistance of automobiles, there are several features in it of interest to aeronautical engineers

The problem of determining the wind resistance of motor vehicles was undertaken some four years ago by the Engineering Experiment Station of the Kansas State Agricultural College. The early attempts to solve the problem were confined to the use of the natural winds, of which, Kansas has plenty at certain seasons of the year An automobile was blocked on a floating circular platform and was headed into the wind The wind velocity was measured with an anemometer and the pull of the float was recorded with a special recording device The extreme gustiness of the wind and its constantly changing direction caused the abandonment of this method in favor of some means of creating an artificial air current

An open air device similar to that illustrated in the March 16 issue of AVIATION, was tried on a small scale A 100 hp Hall Scott airplane engine with a left hand propeller was mounted on a truck and used to create an artificial breeze This device still left considerable to be desired and it was finally decided to construct a full scale wind tunnel

Details of Tunnel

This tunnel has been in the process of construction and alteration for the past two years It is made of wood and galvanized iron supported by concrete piers. The total length is 50 ft The wind is sucked through the tunnel, entering at the flared portion. The entrance opening is 12.5 ft high and 17 ft wide In the first 5 ft the size is reduced to 10 ft. in height and 12 ft in width Thus size is maintained until the testing section is reached, where the size is enlarged to compensate for the area occupied by the car

The fan which is of rather unique design is located at the smallest section of the tunnel, 37 ft from the entrance Extending back 12 ft from the fan is the draft tube or exit cone This cone, which is 10 ft. in diameter at the fan and 15 ft in diameter at the exit end, is made of galvanized iron held in place by wooden frames

The designs of the draft tube and fan were based on a large number of tests with a 1/12 scale model of the tunnel In this model, fans having various numbers of blades with various blade angles were tested Draft tubes with various side slopes and lengths were tried The model of the present draft tube increased the efficiency of the model tunnel nearly 50 per cent Fan speeds as high as 11,500 revolutions per minute were used in the model tunnel giving an air speed of over 150 mi /hr through the fan Proportionately, an exhorbitantly large horsepower was required to do this in the model tunnel and, in view of this fact, it was decided to make the pitch of the large fan adjustable Eight blades seemed to be the most practical number

The blades were cast in the college foundry from an aluminum-copper alloy, having 92 per cent aluminum and 8 per cent copper A portion of an ordinary 9 ft. wooden propeller having 9 5 in maximum blade width, was used as a pattern The blades are 3 5 ft long and have flanged hubs 4 in in diameter at the inner ends. These hubs are securely gripped by a cast steel central hub 2 ft in diameter The complete fan weighs 560 lb and cost $425 00

Blades May be Set by Two Men

Two men can reset the blades to any given angle in about 2 hr The angle is set by a template which fits accurately over the extreme front end of the drive shaft and touches the ahoed of the blade at a point 0 7 of the radius from the center The template is adjusted to the desired angle by means of a protractor set on an accurately machined cast iron surface.

The cast steel hub is made of two pieces held together by 24 bolts The blades are held from turning by friction only Longitudinal motion is prevented both by friction and by a flange on the inside end of each blade Blade angles are measured between the chord of the blade and a vertical plane. Angles of 17 deg , 24 deg., 30.5 deg., 36 deg. and 40 deg have been tried Results of these tests indicate that for maximum efficiency, a blade angle flatter than 17 deg should be used

A maximum velocity of 30 mi./hr in the throat of the tunnel (corresponding to about 60 mi /hr through the fan) was obtained at 745 r p m with 140 electrical horsepower input and 17 deg blade angle Extrapolating on the air-speed fan-speed curve indicated that for 40 mi /hr a fan speed of

Wind Tunnel of Kansas State Agricultural College

1060 r p m. would be required Due to the appearance of casting cracks in two of the blades, it was not considered advisable to further decrease the blade angle and increase the fan speed

At 1000 rp m the computed centrifugal pull is over 34,000 lb per blade Allowing for the bending action of the blade and assuming a casting of medium quality, the factor of safety at this speed is 2.5 In order to minimize the danger in case of a fan blow up, a heavily reinforced concrete ring 9 in thick and 36 in wide was cast around the fan section

The power unit consists of two 55 hp 250 v D C motors direct connected to the fan and mounted on a concrete pier, which is streamlined on the front end

The maximum air speed obtained thus far at the 10 by 12 ft section is 38 mi /hr The electrical power input was 145 hp

A car to be tested is mounted on a large wooden platform which forms part of the floor of the tunnel The platform rests on large beams which run crosswise of the tunnel and whose ends are supported from the roof by chains These chains may be seen in the picture

The effect of even a slight natural wind on the operation of the tunnel is quite pronounced and, at the present time, tests are being made at night in order to utilize the quiet periods

A number of road tests on quiet days will be made in order to correlate actual running conditions with test conditions in the wind tunnel At the conclusion of these tests it is planned to convert the present tunnel into an aeronautical wind tunnel of the conventional type

Navy Prepares for Pulitzer and Schneider Cups

Crack Pilots Entered in All Events

The Navy and Marine Corps pilots to take part in the International Air Races to be held at Mitchel Field, L I, N Y, on Oct. 8, 9 and 10, 1925, and the Schneider Cup Race, to be held at Bay Shore Park, Md, near Baltimore, on Oct. 24, 1925, have been selected, together with the planes they will pilot

Pulitzer Race Entries

The following are the Navy entries for the Pulitzer race next October Lt (jg) A J Williams, U S N., of the Naval Air Station, Anacostia, D C, winner in 1923 and fourth place in 1922, will fly a type R3C1 Curtiss Racer, now under construction for the Navy Lieutenant Williams hopes to be able to add considerably to his world's record speed in 1923 of 243 67 mi /hr with which he won the Trophy Lt. G T. Cuddihy, also of the Naval Air Station, Anacostia, is his alternate. First Lieut. H J. Norton, U S M C, of the Marine Corps Flying Field, Quantico, Va., will pilot a fast Curtiss fighting plane, type PW8B as the second Navy entry in this contest. The Army and the Navy are procuring jointly three planes of the R3C1 type and will enter one each in this contest. The PW8B to be flown by Lieutenant Norton, is an Army type loaned to the Navy for this occasion. Should it be decided that the Navy will fly a second PW6B plane from the Army, it will be flowo by Lieutenant Cuddihy

Liberty Engine Builders' Trophy

On Oct. 8 will be held at Mitchel Field the contest for the Liberty Engine Builders' Trophy, which has been contested for annually since 1922. The Navy entries in this contest will be three DH4B observation planes, powered with Liberty engines The pilots are Lt G R Henderson, U S N, and First Lieut F O Rogers, U S M C, both from the Naval Air Station, Anacostia, D C, and Lt T P Jeter, U S N., from the Plans Division of the Bureau of Aeronautics Lt. C. D. Palmer, U S N., from the Naval Air Station, Anacostia, is reserve pilot for this race

It was recently agreed by both the Army and the Navy that should foreign planes be entered in this contest the Army will make available for this race two fast XO1 or XO2 observation planes, one to be flown by an Army pilot and one by a Navy pilot If this is done, Lieutenant Rogers will pilot the Navy XO plane

Detroit News Trophy

On Oct. 9 at Mitchel Field the contest for the Detroit News Air Transport Trophy for large capacity planes will be held. There will be four Navy entries in this race, as follows Navy SC6 scouting, torpedo and bombing plane, pilot, Lt. J. D Barner, U S N, of the Naval Air Station, Anacostia; Navy CS3 scouting, bombing and torpedo plane, pilot, Lt T N Thweatt, U S N, of the Naval Air Station, Hampton Roads, Va., Navy DT6 bombing plane, pilot, Lt S P Ginder, U S N, of the Aircraft Squadrons of the Scouting Fleet on the East Coast; a Navy DT4 bombing plane or a Marine Corps Martin Bomber, pilot, First Lieut C. F Schilt, of the Marine Flying Field, Quantico, Va. The alternate pilot for this race is Lt. C F Sprague, U S N, of the Naval Air Station, Anacostia

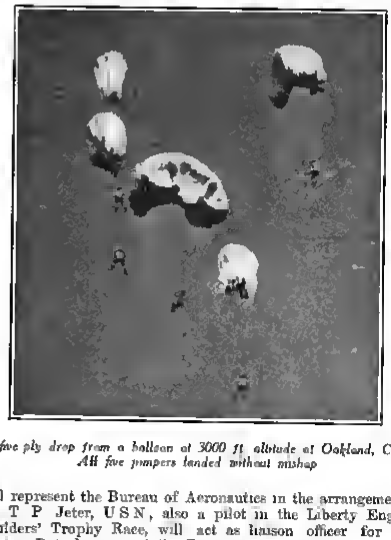
The Schneider Cup

The contest for the Jacques Schneider Maritime Seaplane Trophy, known as the Schneider Cup Race, will be held at Bay Shore Park, Md, near Baltimore, on Oct. 24, 1925. This Trophy is now held by the U. S. Navy, having been won from Great Britain in September, 1923, by Lt. David Rittenhouse, U S N, in the contest held at Cowes, England. His winning speed was 177.36 mi /hr There was no contest for the Trophy in 1924, it being cancelled because of the lack of foreign competition. The Navy entries in this race will be Two R3C1 racers, such as will be used in the Pulitzer contest, converted into seaplanes, and one "stand-by" plane in reserve, a Navy Curtiss R2C2, of 1923 converted into a seaplane last year In trials last summer the R2C2 as a seaplane made a speed of over 220 mi./hr., so that while the two R3C1 planes will probably prove even faster, the R2C2 would be a formidable contender if used Lt. G. T Cuddihy, U S N, (alternate Pulitzer pilot) and Lt R A Ofstie, U S N, of the Plans Division of the Bureau of Aeronautics, will pilot the two R3C1 seaplanes. Both of these pilots hold official world's seaplane speed records made last October at the Naval Air Meet at Bay Shore, Md, Lieutenant Cuddihy at this meet, flying a Navy CR3 racer, set the world's official record for maximum seaplane speed at 188 82 mi /hr., and Lieutenant Ofstie, with a similar plane, established seaplane speed records for distances of 100 and 200 km at 178 25 mi /hr and for 500 km at 161 14 mi /hr If the R2C2 is entered it will be flown by Lt. (jg) F H Conant, U S N, of the Bureau of Aeronautics

Officers in Charge

All the contests, at Mitchel Field and at Baltimore, will be held under the rules of the National Aeronautic Association and the Federation Aeronautique Internationale, and all records made will be officially homologated as world marks

Lt. Comdr H C Wick, U S N, commanding officer of the Naval Air Station, Anacostia, D C, is officer in charge of the Navy Racing Detachment for both the Mitchel Field and Baltimore Races. Lt. Comdr M A Mitscher, U S N, of the Plans Division, Bureau of Aeronautics, Navy Department,



A five ply drop from a balloon at 3000 ft altitude at Oakland, Calif All five jumpers landed without mishap

will represent the Bureau of Aeronautics in the arrangements. Lt T P Jeter, U S N, also a pilot in the Liberty Engine Builders' Trophy Race, will act as liaison officer for the Racing Detachment and the Bureau.

The pilots and reserve pilots met at the Naval Air Station, Anacostia, D C, Aug 10, when Lieutenant Commander Wicks gave preliminary instructions and the organization of the Racing Detachment was perfected

Inaugural Flight of Goodyear "Pilgrim"

World's Smallest Lighter-than-air Craft is Inflated with Helium

"The Pilgrim," the world's smallest airship and the first commercial lighter-than-air craft to be inflated with helium, was christened and sent on its inaugural flight in Akron, Ohio, July 18 by its builders, The Goodyear Tire & Rubber Co.

The little airship, designed for P. W. Litchfield, first vice president of Goodyear, while intended for pleasure cruising, is regarded by the manufacturers as largely a demonstration ground and Congress last year authorized the sale of surplus helium for commercial use.

The helium supply in the past has been limited by government appropriations but with a market for helium the government plant could be kept in operation throughout the entire year making possible all the helium commercial or private owners want.

Start of Inaugural Flight of Goodyear "Pilgrim" airship at Akron, Ohio

ship and will be used in certain tests and experimental work.

"The Pilgrim" is 110 ft. long, 45 ft. high, and has a capacity for 50,000 cu. ft. of helium, being approximately one-50th the size of the Zeppelin "Los Angeles."

Powered with a 60 hp. Lawrance radial engine, the small air cruiser has a maximum speed of almost 60 mi./hr. and a cruising radius of from 10 to 20 hrs., the economy in fuel consumption being pronounced.

Besides the pilot and motor mechanic, facilities for the transportation of two passengers are provided for in the streamlined cabin suspended directly under the envelope and entirely enclosed.

A portable mooring mast has been devised which can be set up anywhere that 250 ft. of level ground is available, and attached to the mast the airship will revolve with the wind. Other masts are also in the construction stage in the Goodyear factory.

Mr. Litchfield believes that the future of this type ship may bring mooring masts at country clubs and on private estates and even the holding of airship regattas in the same way that motor boat and yachting clubs now have similar events, bringing all the pleasures of yachting to those who live inland.

The general use of these small airships is conditioned on helium. There is plenty of the inflation gas available in the

"The Pilgrim" will be operated in the vicinity of Akron during the remainder of the summer and early fall, Mr. Litchfield announced.

Stability Equations for Airship Hulls

NACA Report No. 212

This report is by A. F. Zahm. In the text are derived simple formulae for determining directly, from the data of wind tunnel tests of a model of an airship hull, what shall be the approximate character of oscillation, in pitch or yaw, of the full-scale ship when slightly disturbed from steady forward motion.

Aviation Oil Extracted from Crickets

It appears that a very precious oil, suitable for aviation, since it does not congeal even at a very high altitude, can be extracted from crickets, says Consular advices to the Department of Commerce from Algiers.

Recently about 18 tons of crickets were sent to Holland from Algeria, part of this quantity was utilized for feeding poultry, and from the remainder the oil for aviation purposes was extracted and has apparently given every satisfaction.

Plywood and Metal-Faced Plywood

By Arma Elmendorf

For several years prior to the war Henry L. Haskell of Ludington, Mich., experimented with blood albumin glue for making a truly waterproof plywood. The experiments were successful and early in 1917 panels were made which could be boiled in water without separating the plies. Various uses immediately suggested themselves for the new high grade waterproof plywood. Among these uses the manufacture of canoes was first considered and molds were made for pressing large 3-ply sheets into the form of a canoe. With the new glue very long panels could be made by successive pressing between hot plates so that the entire canoe could be made of one sheet. After pressing such a sheet it was allowed to dry in molds, producing in this way a shell which when reinforced along the edges with a light framing became a complete canoe.

With the entrance of the United States into the World War, government engineers looked for methods of making airplane fuselages on a large scale and the method of molding plywood as perfected for canoes was considered. The Haskelite Manufacturing Corp. was organized and incorporated on Dec. 11, 1917, and a large modern factory building was erected in Grand Rapids, Mich., expressly for the purpose of manufacturing plywood for aircraft and for making airplane fuselages by molding plywood. Powerful presses and hydraulic equipment were installed and by the middle of May, 1918, the factory was in operation. A number of fuselages were built and large quantities of very high grade waterproof plywood were furnished to aircraft manufacturers throughout the United States. In one factory alone 3,600 airplanes were made in which Haskelite plywood was used. Numerous seaplanes were likewise made of Haskelite. For some time prior to the close of the war, the company reached its peak production under the direction of George R. Meyercord, its president. At the close of the war the company had orders on its books for more than a million dollars worth of aircraft plywood. In addition to its use for side paneling of airplane fuselages, Haskelite plywood was used for wing ribs and wing beams, for engine bearers, bulkheads, instrument boards, seat backs, floors and lining.

Tests made by various government research laboratories soon proved that the waterproof blood albumin glue used by the Haskelite Manufacturing Corp. produced plywood of the high grade required by the U. S. Navy. It was found that this glue withstood very severe shear tests after the material had been soaked or boiled and that the material withstood the severe stresses introduced by this test.

It is the policy of the company to maintain the high quality of its products by keeping constant scientific control of manufacturing processes. A research laboratory under the direction of Dr. W. A. Drushel is maintained for that purpose and for the purpose of improving and developing new processes. Prof. O. H. Basquin of Northwestern University is also on the company's technical staff.

Shortly after the close of the war another improvement was introduced in the art of manufacturing plywood by cementing metal to the faces. A process was developed whereby zinc coated steel sheets could be firmly cemented to wood. The product was an entirely new material with new and remarkable physical properties. It was found, for example, that 0.3125 in. plywood faced with metal, as described, was from 50 to 100 times as stiff and resistant to buckling as sheet steel of the same weight. In addition to possessing remarkable strength combined with light weight, the new panel was absolutely waterproof as no water could possibly reach the glue or the wood when the edges of the panels were protected.

Difficulty was encountered in the gluing of aluminum to plywood and this problem was only solved after several years of experimenting. It is now being made by the Haskelite Manufacturing Corp. especially for aircraft by cementing very thin sheet aluminum to plywood ranging in thickness from 0.0625 in. to 0.250 in. A light plywood is used which is not only glued with the highest grade of blood albumin waterproof glue but it is made weatherproof by the metal which keeps all rain and moisture away from the panel.

For certain uses in which aluminum is attacked by salt or chemicals of different kinds, a third product is manufactured in which Monel metal is cemented to the plywood. As this metal has approximately the strength and other physical properties of steel, the resulting combination has the strength obtained with sheet steel, and it also resists corrosion like plain Monel metal.

The gluing process in use by the Haskelite Manufacturing Corp. makes possible the production of extremely large plywood panels. Haskelite panels have been made for the Navy that were 7 ft. wide and more than 50 ft. long. Other panels are limited in size by the sizes to which metal sheets can be rolled.

MacMillan Planes Assembled

The three Loening amphibians which were taken along by the MacMillan Arctic expedition have been assembled at Etah, Greenland, and are undergoing flight and radio tests. The amphibians were assembled on a rocky little beach in remarkably quick time and are now moored out in the bay.

The first flights were made on Aug. 4 and the equipment performed most satisfactorily. Cloudy weather, with rain but little wind, has been encountered and the temperature has been about 40 deg. Fahrenheit.

A finished picture produced in flight within 7 min., in specially equipped photographic plane with Eastman Air Service Camera and rapid film

The short wave radio seems to be giving excellent results and the mother ships have been sending and receiving messages from the United States with great regularity.

For purposes of further exploration an advance air base will be established at Cape Thomas Hubbard. Cape Thomas Hubbard is 260 mi. northwest of Etah, and the plan of the expedition is understood to be to establish an intermediate base about half way between Etah and that cape taking supplies and stores to the base, which will be available for use in the event of an emergency. This base is planned because the plans for the Naval end of the expedition have been worked out purposely along conservative lines in regard to safety.

Splendid Work Done in Columbus

Aero Club Makes Report of Year's Progress that Should Encourage Other Cities

There have been so many requests from individuals in cities inquiring how a local aero club can aid in the development of aviation that the following account sent by the Aero Club of Columbus is printed. It shows how an active group of men in any city can arouse interest in aviation and take an active part in forming a national air policy—EDITOR.

In this report it is desired to review briefly, local aviation activities and to point out the work the Aero Club of Columbus is doing in looking after the city's interests in the general development of air navigation now taking place.

Like practically every other organization which has undertaken the task of serving its community in some one line of public endeavor, it is extremely hard for anyone not closely connected with the work to see the actual progress that is being made.

A short four years ago Columbus was in no way identified with aviation. There was no landing field where an airplane might come to earth in safety. There was nothing being done to focus attention on Columbus as a possible unit in the national airways system. The city was doing nothing to exploit its many natural advantages as an aviation center. No encouragement was being held out to local aviation development and there was little, if any, public interest in the subject generally.

Today an entirely different picture is presented.

(1) Except for the big government experimental field at Dayton, *Columbus claims to have the finest flying field in Ohio*—a field that has *all* the advantages desirable for its purpose.

(2) Columbus is closely identified with national aviation development because of the facilities it now provides for incoming air traffic, of which there is a surprising volume.

(3) Attention is now being focused on Columbus as the possible site for one of the few *big* airports to be established on the proposed great transcontinental air line.

(4) Through the Aero Club of Columbus everything possible is being done to broadcast this city's natural advantages as an air center, to the organizations, firms and individuals who are planning our future commercial airways.

(5) The Aero Club of Columbus is doing all in its power to stimulate and encourage local aviation activities and development.

(6) The Aero Club is keeping the local newspapers informed of interesting happenings in aviation and through these newspaper write-ups, local public interest is kept eager and alive.

This is the kind of work the Aero Club of Columbus is pledged to carry on—and is carrying on with the financial aid of its members. The money derived from its membership is spent to further the city's interest in the field of aviation and reviewing the club's achievements along this line, its members may well take pride in the accomplishments which they have made possible.

Some Things the Aero Club of Columbus has Done

Norton Field—Solely through the Club's efforts Columbus today has one of the finest and best known federal flying fields of its type in the Middle-West. This without municipal aid and in the face of the stiffest competition from other Ohio cities who wanted to gain this field for themselves.

Airways—By gaining Norton Field, credit is due the Club for the placement of Columbus on the National Airways Map. Thus the bulk of East and West air traffic is routed through this city. While this may be said to be of minor importance at the present time, it is going to mean much to Columbus in the near future as the development of commercial air traffic is pushed forward.

Air Mail—The Aero Club has been urging the extension of the Air Mail Service to Columbus ever since the establishment of Norton Field and this service is practically assured the city in the next extension that is made. This will mean much to our business firms and banks—particularly the latter as it will greatly reduce the amount of "float money" and save thousands of dollars annually.

Flying Events—Through the Aero Club, Columbus has been given the opportunity to view aircraft and their performance at close range. Numerous and interesting events have been staged at Norton Field under the auspices of the Club and have been witnessed by tens of thousands of persons. During the summer months, members of the Club who hold flying ratings take their weekly practice and training at Norton Field and on Saturday afternoons and Sundays, hundreds of people drive into the field to watch these maneuvers.

National Defense—Through the Aero Club, interest has been stimulated in the Air Service Reserve and many Aero Club members now belong to this important branch of our national defense system. Aiding this in the gaining of commissioned and enlisted personnel for Air Service Reserve Units is a patriotic work which has won commendation for our organization.

Air Legislation—The Aero Club of Columbus has gone on record as favoring legislation of air traffic. This is highly important to the success of aviation and the Club has been instrumental in having legal restriction and control placed on flying over the city, "stunting" over crowds, etc.

From the above it will be readily seen that the Aero Club of Columbus has been extremely active in all things aeronautic in Columbus and the benefit of these activities to the city's progress is admitted by all thinking citizens.

There has recently been requested and authorized by the Militia Bureau, the establishment of a National Guard Air Field and Air Squadron for the state of Ohio. To have this new field and squadron allotted to Columbus is most desirable from every angle.

To carry on this work of the Aero Club it is urgent that a permanent headquarters be established. Plans for such a headquarters have been entertained for some time by the Club, yet the problem of financing the project as at present outlined has made postponement to this date advisable. Now, however, it is felt that this work can be successfully undertaken at once, if the membership will lend its cooperation and support.

The following is the plan endorsed by the Board of Directors.

Inasmuch as Norton Field is the center of local aviation activity it is the logical place for establishing the Aero Club headquarters. The Club controls an acre of land at the edge of the field proper, on the Broad Street side, and this property is eminently suited to the Club's purpose. This site is ideal, in that it gives a fine and unobstructed view of the field and is easily accessible from the highway. The Club has a lease on the ground with an option to buy at the expiration of the lease. It also owns the two-story frame building on the property and the plan contemplates the re-modeling of this structure into a modest club house where an Aero Club office can be maintained and where members and their guests can gather to view the interesting flying maneuvers that take place.

At least one-half of the money necessary for this undertaking can be taken care of by the collection of this year's dues from members, without dangerously depleting the Club's operating fund. It is therefore urgent that prompt payment of members' dues be made so as to make a building fund immediately available.

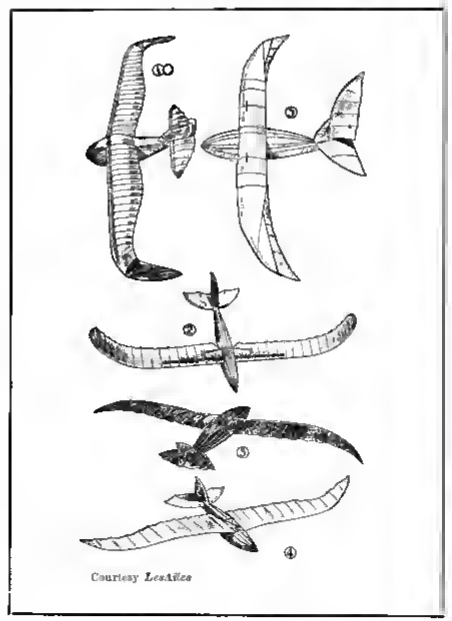
The balance of the money needed can be raised in several ways—by subscriptions, by additional memberships, and by the staging of one or two Air Carnivals at the field this summer. It is likely that all three of these methods will be used.

LIGHT PLANES AND GLIDERS

Edited by Edmund T. Allen

Flexible Wings Score in Gliding Meet

In a gliding meet held on June 14, in France, the advantage of flexible wing structure for gliding was amply demonstrated when the first seven machines to place were all fitted with devices which allow the wings to adjust themselves to varying air currents. Altogether there were 49 entries of which 36 actually flew. The Landes brothers again won the first three places in very decisive fashion. The longest flight was 8 min. The balloon from which the planes were dropped was at an altitude of 426 ft. which would give a sinking speed of less than one foot per second. If as the French claim there are no rising currents on the field where the balloon is anchored, the Landes brothers must be making considerable progress toward true aerodynamic flight. Their nearest competitor remained in the air only 3 min.



Courtesy *Lectures*

Some gliders at the Saint-Cyr meeting. 1. The Nemausat, the tips of the wings are completely flexible. 2. The Georges Beuchet machine which won fourth place. 3. The Thee Landes. 4. The Robert Landes. 5. The Bellavoine the similarity to bird shapes is remarkable.

Photo Kadel & Herbert

Some German Gliders at the recent meet

The Engine Question

Dear Mr. Allen:—

May I enter a mild protest to the suggestion of Maurice M. Douglas which appeared in your columns on July 27. I feel that Mr. Douglas is slightly awe-stricken with the development of engines for the track and has apparently not familiarized himself with the vast difference between the problems of designing a first class light plane engine and a high speed engine for racing purposes.

First, let me point out the question of weight. A light plane engine must come within certain weight limits, otherwise it will not satisfy the requirements. A few added pounds to a racing engine is no severe handicap if it provides greater durability and better performance.

Propellers for aircraft are limited to a rather narrow speed range for best efficiency, so in order to gain power by employing high speeds of 4,000 to 5,000 r.p.m., such as is done in the case of racing engines, we would be compelled to use a geared drive, which is not only proportionately bulky, but oftentimes unreliable. To keep down the piston inertia forces at such high speeds requires a larger number of cylinders of small bore. Engines of this type are not only unsuited for light planes but decidedly too costly to give a moment's consideration. Incidently, it might be well to mention that racing engines operate well beyond the speeds where detonation occurs with present day fuel, hence it is possible to employ higher compression ratios and derive a further increase in power.

The light plane engine must be air cooled. The reasons are so obvious that a detailed explanation here is quite out of order. This fact alone seperates the design problems so distinctly that I cannot understand how Mr. Douglas got the idea that a successful designer of racing car engines could startle the world with a light plane engine design.

We should have the greatest respect for the excellent work done on racing car engines in recent years, but that doesn't mean that we should concede their designers best fitted to develop aircraft engines, either big or small. In fact, records of previous attempts along this line should create the opposite impression. Now let someone come along with an equally ridiculous counter suggestion that hereafter we should have aircraft engine designers develop better racing car engines.

The reason we have no more than possibly one first class light plane engine developed in this country to date is that there aren't any buyers. There seems to be plenty of enthusiasm but that is as far as it goes. During these busy times, how many can you find that want to build a light plane engine just for the glory in the thing?

A FREQUENT CONTRIBUTOR.

AIRPORTS AND AIRWAYS

Carolina News

By Elliott Springs

Johnny Crowell, our premier commercial aviator, distinguished himself a short time ago by flying 240 m one afternoon in his Jenny and bringing some rabies serum from Columbia which saved the life of a man who had been bitten by an angry dog

Crowell was employed by D. W. Doherty, a photographer of Greensboro, to fly him about so he could take aerial photographs of various prominent features of the landscape. They made a number of flights and then Mr. Doherty decided that the money he paid Crowell was more or less wasted as flying was comparatively simple. So one day when Crowell was out of town he went out to the Polo Field and started up the Jenny. He had helped Crowell and had no difficulty in getting the engine started. He even knew enough to warm up the engine before taking off. But right there his aeronautical information ceased as he had never had his hands on the controls. He managed to taxi out to the end of the Polo Field and took off. Then he did what many good pilots have done before they became good pilots. He went straight up two hundred feet and then came straight down two hundred and one feet. Thanks to the exhilirating climate and the fragrance of the Long Leaf Pine which have made the Carolinas famous, Mr. Doherty is still with us, but his face looks like the directions on King Tut's sarcophagus.

Crowell, needing a new machine, purchased a shopworn Avro, which he is rebuilding. He is using a DH undercarriage, Oriole wings and a 125 hp Anzani motor. When he is ready for the test flight, I suggest that you send Cy Caldwell down to cover the event.

I had two Thomas Morse Scouts, one with a Gnome and one with a 130 Clerget. The Gnome ceased firing one day as I was inspecting my crops, and stuck its nose in a potato hill, or rather a hill covered with potatoes, no—covered with potato vines, the fruit is underneath, or was underneath until my nose exposed them. The Clerget-motored one threw the prop just as I was confidently expecting to clear some trees. To my great sorrow I completely demolished one of the finest specimens of Long Leaf Pine that ever made the Carolinas famous. I swapped both planes to Crowell for five gallons of dope.

I have just put a new Anzani motor in my Baco and hope to fly up to the Races in October in it. I have also increased the size of my airdrome by taking out a road through it and removing some wires. The local blacksmith here in Fort Mill, who has been making my tailskids for the past three years, has perfected a method of manufacturing steerable tailskids from Ford front springs, a Pierce-Arrow clutch block and two cotton mill spindles. He was all out for securing a patent and joining the Manufacturers Aircraft Association, but I persuaded him that it was his patriotic duty to set an example to Congress and give the industry as a whole the benefit of his invention. I can recommend them highly and with a small attachment they can be made to fit tree balloons.

Cleveland News

By Cy Caldwell

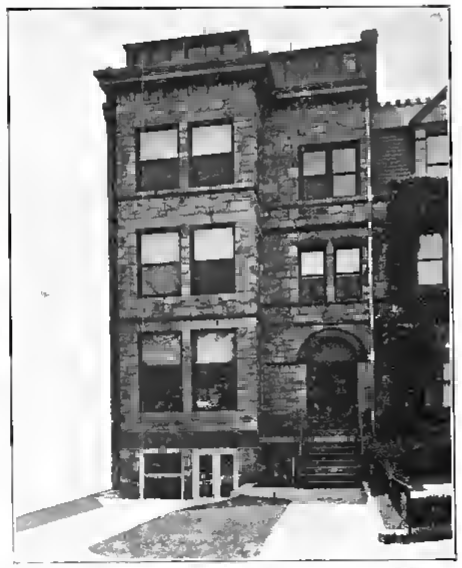
William P. Hoare has been appointed field manager for Air Mail Service at Cleveland, an appointment satisfactory not only to Bill himself but also to those who know and appreciate the work he has done since he joined the Air Mail in February 1921.

Bill Hoare is an old timer in aviation. Joining the Army Air Service in August, 1917, he stuck there until they threw him out in March, 1919. He then worked for the Service Aviation Co., Wabash, Ind., until February 1921, with such success that the company is no longer in existence. He probably knows more about Libertys and DH's than any man living.

The very fact that he has worked steadily at aviation for eight years and sustained life without appealing to the Community Fund is no mean achievement in itself.

• • •

H. B. Shaver, assistant superintendent, Eastern Division, Air Mail, and also former field manager is now devoting his entire time to division duties, which, since the inauguration of night flying July 1, have increased greatly, in line with the doubled activities of the division. As an indication of Air Mail efficiency it is notable that the service has been expanded



New Washington home of the National Aeronautic Association

100 per cent by running both day and night with but little increase in personnel.

Division Headquarters are now at Cleveland Municipal Airport, giving Supt. J. E. Whitbeck the advantage of being at the center of his division and the pleasure of living in Cleveland, the center of civilization. It has the further advantage of removing him from the influence of the Quiet Birdmen, a collection of flying bozos in New York, who meet evenings and stagger home mornings.

Whitbeck started life by running away to sea—in fact many of us flying men got our start at sea. I started on the old Erie Canal, myself, while Porter Adams used to run a swan boat on the Frog Pond, Boston.

• • •

Two of the stock SC models, Navy scouting, torpedo and bombing planes, built by the Glenn L. Martin Co. have been specially constructed to take the new Packard 2500 engine. Tests have been conducted for the past week at Martin Field with the first of these planes using a 3 bladed metal propeller designed by the Standard Steel Propeller Co. With this engine and propeller the SC leaped into the air with all the abandon of an aircraft manufacturer who has just been awarded a government contract. Performance data is not available for publication, but DH pilots are advised to get out of the way when the SC goes by.

It must be a great relief to Mr. Packard to learn that this, the first direct drive Packard 2500 ever taken into the air, has been up, and what is even more important, has got down again, all in one piece. I have noticed, Mr. Packard, that engines have gone up intact and come down scattered, as it were. Many's the time, Mr. Packard, I have no doubt you have asked yourself "Will this thing really go?" And as you have sat on the back porch wondering and designing you have worried and grown peevish, perchance, and told Mrs. Packard to keep the kids quiet so you could think better, or even at all. But your worries are over; your engine has flown—and I have flown it. This is a big thing for you.

Now Mr. Packard, I want to suggest in the most delicate manner in the world, for I am delicacy itself, that you should be grateful to me for taking this engine up—and down again. And naturally you will want to show your gratitude in some fitting manner. Now, I have admired your car for years. That slogan "Ask the man who owns one," impressed me. I have asked the man—how he got it. It seems he bought it.

Now, Mr. Packard, my wife likes the sedan, though personally I would be happy with a touring car. If you think that is too big for me, suppose we say a roadster? Not necessarily an 8—a 6 would suit me fine. It need not even be new—I am not too proud to drive a used Packard. A used roadster, say, about 1924—or 1920 even. As a matter of fact if you have an old Ford around the garage I could use it very conveniently.

Martin Airport, Santa Ana, Calif.

By Charles Levernig

Santa Ana, Calif., has an excellent airport operated by Eddie Martin, chief pilot, instructor and owner manager.

The Martin Airport is located at the south end of Main Street, three miles south of Santa Ana, Calif., and six miles north of the Pacific Ocean, the place on the Pacific which is south of the airport is Corona Del Mar, Orange County Harbor. The airport proper contains sixty acres, bordered on the northeast and northwest by boulevards, and on the other side which is curved, by open country, hills and the ocean. These features make it very desirable as an airport.

Equipment at the airport at present includes only a wind sock, located at the northeast corner of the field, gasoline, oil, water and air service, housing for the tools and spare parts, and a special French Nieuport, a Tomme, a Boeing and three Jennies belonging to Eddie Martin. A number of privately owned ships operate on the field. Buildings, to the extent of hangars and shops will be erected in the near future.

Business at the airport includes student instructions, special excursions, passenger trips and repair work. The personnel includes Eddie Martin, two other pilots and a regular mechanic. All ships, Army, Navy and civilian are welcome to the airport at all times.

Doctor Flies to Quebec

Dr. David C. Bull, who flew 550 m from New York to Grand Anse, Quebec, on Aug. 10, to treat 14-year old Alexander Stillman, a son of Mrs. Anne U. Stillman, for a broken arm, arrived there safely a few hours after his departure from Curtiss Field at Mineola.

Dr. Bull made the journey in two planes because of a Canadian Government ruling forbidding alien pilots to carry civilians into Canadian territory. The trip was begun in a Curtiss airplane piloted by John P. Andrews, who returned to Mineola, and was concluded from the Canadian border in a Huff Deland seaplane piloted by Capt. K. Saunders. The machines were owned by the Fairchild Aerial Surveys of the United States and Canada.

The physician left Mineola at 6:30 o'clock and reached Grand Anse, Mrs. Stillman's lodge, before noon. Mrs. Stillman wired for Dr. C. C. Sweet of Ossining, Alexander's physician when the family lived near Scarborough, late Sunday night, but he was unable to make the journey, whereupon Dr. Bull was asked to go.

The boy fractured his right arm at the elbow when he dived in shallow water on Sunday.

Magistrate Overlooks Aviation Ordinance

One of the first cases of an arrest under an ordinance which prohibits flying at low altitude over New York City was dismissed on Aug. 3 by the city magistrate of the 8th District Court apparently because the magistrate could not locate such an ordinance.

The complainant in the case was John H. Jones, former civilian flying instructor during the war, 95 C Edgewater Camp, on Aug. 2 who had arrested George Dufhirch, 27, an aviator of Elmhurst, L. I., for flying, as described by Jones, at an altitude of less than 1,000 ft. over Jones' home. Dufhirch was held in $500 bail for appearance the next day.

Jones stated to an AVIATION representative that on the two previous Sundays Dufhirch, who carries passengers with an MF flying boat with OX5 engine, had flown very low over Edgewater Camp, and that he at first warned Dufhirch, but that when the latter continued the performance on the next Sunday he decided to have Dufhirch arrested. On the last occasion Jones claimed that the MF boat barely skimmed the roof of his bungalow, which is back about four blocks from the water's edge. Jones pointed out, also, that if the pilot's engine had gone dead, he would have wrecked at least two of the closely built bungalows.

In dismissing the case the magistrate informed the complainant that the only ordinance he could find relating to aviation was one forbidding parachute descents or airplane landings in city parks. He suggested that Jones could, if he wished, take the case to a Federal Court, despite the absence of any frderal aviation law.

Pioneer Instrument Co. Purchases Plane

The Pioneer Instrument Co. have purchased a JN4D from G. S. Ireland of Garden City for the purpose of flight testing instruments and equipment manufactured by the company. The plane is being flown by Morris M. Titterington, inventor of many aircraft instruments.

Mr. Titterington is a pioneer aviator having built and flown his own plane in 1911. This early machine flew with power furnished by a Ford engine. In 1913, he joined Glenn H. Curtiss at Hammondsport, N. Y., and stayed with him until 1914, when he went with the Sperry Company. During the war Mr. Titterington was placed in charge of engineering and development work connected with aerial torpedoes and did a great amount of flying.

Gates Flying Circus at Washington

"Feats of Flying Circus Thrill Thousands" is a typical heading taken from the local papers when the Gates Circus visited Washington, D. C. The circus has been operating for several years but mostly in the South and Middle West. The performance in Washington was for the benefit of the Soldiers', Sailors' and Marines' Club of Washington.

"Diavolo" Krantz stood on the top wing while the plane looped the loop; he changed from one plane to another and hung by his toes while the audience gasped for breath. Others who entertained with air acrobatics were "Big Jack" Ashcraft, "Fearless Freddie" Lund and "Wild Bill" Wunderlich.

A parachute jump, landing to the mark and a smoke screen put down by the Army were other features of the afternoon.

Air Mail Truck Held Up

A postal truck which contained eight pouches of air mail from Eastern points was held up in Market Street, San Francisco, on Aug. 8 the robbers escaping by automobile. The exact value of the sacks has not been determined but it is believed that it will be exceptionally high. The six armed men who staged the hold up have not as yet been captured.

UNITED STATES AIR FORCES

U. S. ARMY AIR SERVICE

Army Entries in Pulitzer Race

First Lieut Cyrus Bettis, A.S., has been designated by the Chief of Air Service to pilot the Curtiss Racer, with First Lieut. James H. Doolittle, of trans-continental flight fame, as the alternate pilot. For the second and third entries, using the specially prepared high-speed pursuit ships, of which exact duplicates will be furnished the Navy, Capt Harvey W. Cook and 2nd Lieut. Leo H. Dawson have been chosen as the pilots.

Lieutenant Bettis, whose participation in the International Races last year resulted in his winning the John L. Mitchell Trophy, was born at Carsonville, Mich., Jan. 2, 1893. He was commissioned a second lieutenant in the Air Service during the World War. He has had considerable experience as a pilot on Mexican Border patrol duty and served a tour of duty of two years in the Philippine Islands. At present he is serving with the First Pursuit Group at Selfridge Field, Mt. Clemens, Mich. He has approximately 1800 flying hours to his credit.

Lieut James H. Doolittle, one of the foremost cross-country fliers in the Air Service, was born Dec 14, 1896, at Alameda, Calif. He holds the degree of Bachelor of Arts, University of California. Joining the Air Service during the World War, he was commissioned a second lieutenant, on March 11, 1918. For two years he served on Mexican Border patrol duty.

Lieutenant Doolittle is an officer of considerable scholastic attainments, being a graduate of the Air Service Mechanics School, the Air Service Engineering School, and the Massachusetts Institute of Technology, where he just recently completed a two years' course in aeronautical engineering. The outstanding feat in his career as an aviator is his one-stop transcontinental flight in a standard DeHaviland observation airplane from Jacksonville, Fla., to San Diego, Calif., on Sept 2, 1922. He accomplished this noteworthy flight in less than 24 hrs, his elapsed time from coast to coast being 22 hr 30 min.

Capt Harvey W. Cook was born at Wilkinson, Ind., June 30, 1892. He attended DePau University and Washington and Jefferson College. During the World War he served overseas with the Allies, but upon America entering the conflict he enlisted in the Air Service in September, 1917, completed his flying training, and was commissioned a first lieutenant.

This officer was one of the first members of the 94th Squadron, the first American Pursuit organization at the front, and he rendered gallant and meritorious service during the entire operations of the Air Service, serving actively at Chateau Thierry, San Mihiel and the Argonne. He is officially credited with having destroyed seven enemy aircraft, and for his exceptional service he was awarded the Distinguished Service Cross with oak leaf cluster.

Upon his return to the United States, Captain Cook left the military service, but later accepted a commission as captain in the Air Service, Regular Army. He attended the Engineering School at McCook Field, Dayton, Ohio, and upon graduation served for a time at the Air Service representative at the plant of the L.W.F. Aeronautical Corp. At present he is on duty as instructor at the Air Service Tactical School, Langley Field, Va.

Lieut. Leo H. Dawson, another Air Service officer who was honored with the award of the Distinguished Service Cross, was born at Maxwell City, N. M., Nov 8, 1893. Joining the Air Service during the World War, he received his flying training at Chanute Field, Rantoul, Ill., and was commissioned a second lieutenant. He was shortly thereafter ordered to duty with the A.E.F. overseas, served with the 94th and 166th Aero Squadrons, and rendered conspicuous service.

On one occasion while on a voluntary patrol Lieutenant Dawson encountered seven enemy planes at an altitude of 2,000 meters. After a brief engagement his guns jammed, but after repairing the jam in the air, all the while under the heavy fire of the enemy, he returned to the fight, shot down one of the enemy in flames and drove off the others. It was for this act of extraordinary heroism that he received the Distinguished Service Cross. Several months later he was awarded a bar to be worn with the Cross for another act of bravery. Sighting four German Rumpler planes, Lieutenant Dawson immediately attacked them, and, despite the numerical superiority of the enemy, destroyed one of them and caused the remaining three to scatter and return to their lines.

Lieutenant Dawson received his honorable discharge from the service in June, 1919. On Jan 5, 1923, he accepted a permanent appointment in the Regular Army as second lieutenant, and became a student at the School of Aerial Photography, Air Service Technical School, Chanute Field. Upon his graduation he was assigned as photographic officer at that station.

Military Airplanes

Pilots of National Guard organizations will no doubt welcome the news that they are to receive a new type of airplane. Transfer orders have just been received by the San Antonio Air Intermediate Depot directing the shipment of 18 TW3 airplanes to various National Guard units throughout the States as follows: Texas, Alahama, Colorado, Missouri, California, Washington, Minnesota, New York, Maryland, Massachusetts and Connecticut. These airplanes are being completely reconditioned with Wright-E type engines before being distributed to the above National Guard units. This work is being carried on at the San Antonio Depot in addition to the regular work of servicing the Army Air Service organizations in this area.

Reserve Officers' Camp at Wilbur Wright Field

By Walter M. Moore

A training camp for Air Service Reserve officers was held at Wilbur Wright Field, located at Fairfield, Ohio, (10 mi. northeast of Dayton) from July 26 to Aug 9, 1925. The Field is well adapted for training purposes, every facility being afforded for flying instruction, and for instruction in engineering and supply problems.

Fifty-seven Reserve Officers were in attendance; 36 of these were pilots, 8 were observers, and the rest had no flying rating. There were also two medical officers.

Major E. L. Hoffman, the commanding officer of the camp, is a Regular Army officer, his present station being Grissed Field, of which he is in command. Grisard Field is located just outside of Cincinnati. Major Hoffman has had a wide experience in conducting camps similar to this one.

Major McQuitty exercised active supervision over the camp, under the general direction of Major Hoffman.

Following is a paragraph from Squadron Orders No 2, showing the general purpose of the training:

Squadron Orders No 2 "The existence and very heart of the Officers Reserve Corps is the word Emergency. If that is the case, our training should all be directed so that if a national emergency really existed, we would know exactly what to do from the very first day, after we arrive at the station that we are ordered to."

The Reserve Officers reported for duty at Wilbur Wright Field on July 26 in accordance with orders issued to the 84th Division, and the 100th Division by the Commanding General, 5th Corps Area. The schedule was immediately published, providing two classes of instruction, ground instruction and air instruction.

Ground instruction consisted of practical work on air-cooled engines, (several different types being studied) ignition systems, aircraft, parachutes, armament, radio, photography, and general organization and mobilization work. The first week of the flying training consisted of dual instruction, then solo work with Curtiss Jennies. During the last half of the first week, dual instruction and solo flying with DeHavilands was carried on.

The system of training as explained by Major McQuitty was a gradual progression from primary to advanced air work, leading up through various stages of progress until general orders, combat orders, and field orders were given for aerial battle in connection with imaginary ground forces. Various missions were assigned to the pilots during the combat work, such as observation of dams on the river, and observation of bridges and railroads. Later, bombardment squadrons were sent out, to demolish imaginary structures. The maneuvers were carried out while the Corps Area Commander of the 5th Corps Area, (Gen Robert L. Howze) was present.

The training of this group of Reserve officers was very rapid, and the progress made was beyond expectations. Recommendations have been made that the same group be recalled in one body next year, and that they be sent to some camp for advanced work, where they may work with other ground troops.

The officers were able to form general battle situations, issue orders, and carry them out.

Army Air Orders

Spec Or. 181 relating to Capt. William Phillips Bates, A.S.R., revoked.

First Lieut. Elliott White Springs, A.S.R., Fort Mill, S. C., to active duty Selfridge Field, reverting to inactive status Aug. 30.

Staff Serg. James P. Meoney, A.S., Brooks Field, transferred to A.S. Tech. Sch., Chanute Field.

Staff Serg. Curtis A. Harvey, A.S., Chanute Field, transferred to 46th Sch. Sqd., Brooks Field.

Capt. Walter F. Krans, A.S., McCook Field, to Walter Reed Hospital, Washington, for observation and treatment. Upon relief from the hospital, Captain Kraus will proceed to Cambridge for instruction at the Mass. Inst. Tech.

First Serg. Charles E. Strahan, A.S., France Field, C. Z., retired.

Sec. Lieut. Frederick Harper Wilson, A.S.R., Washington, to active duty Brooks Field, reverting to inactive status Dec. 28.

Capt. Albert W. Stevens, A.S., Chanute Field, to Scott Field.

First Lieut. Russell H. Cooper, A.S., Chanute Field, to Scott Field.

First Lieut. James C. Shively, A.S., Scott Field, to Brooks Field.

First Lieut. Clyde A. Kuntz, A.S., Scott Field, to Brooks Field.

Sec. Lieut. Fred A. Ingalls, A.S., San Antonio, to Scott Field.

U. S. NAVAL AVIATION

New York Wants Naval Base as Park

Assistant Secretary of the Navy T. Douglas Robinson has issued the following statement:

The Navy is very much concerned in regard to the necessity of abolishing its present air base at Far Rockaway, L. I. This action is imperative because of the refusal of the Sinking Fund Commission of the city of New York to cede this site to the Navy, the use of which was granted as a war-time emergency measure. Unless the city of New York reverses this decision and gives to the Navy the use of this site at Far Rockaway for an extended period of years, a vital link in the defense plans is smashed. These plans call for an air base in the New York—Narragansett section. Far Rockaway is the logical place for this base. The location is in the immediate vicinity of the Ambrose Channel Light ship, which is the focus of the sailing routes of the greater part of American commerce. Such a point is particularly favorable for the effective use of submarines by an enemy seeking to destroy our shipping. Sea-planes control in conjunction with the use of small swift surface craft, has been found to be the only effective method by which such a menace can be checked. The Navy Department selected this site, after a careful study of all available sites in the New York—Narragansett section and no other location can be found combining all the defense advantages possessed by this one. It now stands as a completed point for coastal patrol work. It has already cost the Government more than $1,660,000. If the city of New York still insists that the Navy abandon this vital link in our defense chain, then this expenditure is a total loss. In addition, the New York—Narragansett sector is without Naval air defense indefinitely, for it is very improbable that new appropriations can be secured to acquire and build up another site. In that case, no provision remains for the proper aerial defense of the city of New York against enemy raids from the sea. The Navy understands that the legislature of the state of New York has granted the city of New York authority to provide for the Navy an adequate air base. Therefore, it remains with the government of the city of New York as to whether this vital air base is maintained or is abandoned. The Navy Department fully appreciates the action that has been taken in the past by the New York City authorities in giving the Navy the use of this land, and feels confident that when all facts are known, and the necessity of continuing this base is realized, the city will grant the Navy's request for further and continued use of the land now occupied as an air base at Far Rockaway, Long Island. Before taking final action for the disposal of the buildings, the Navy Department will again make formal application to the Mayor of the City of New York and the Commissioners of the Sinking Fund of the City of New York for the session, or a long time lease, of all or a portion of the property now occupied by the Navy.

Shenandoah to Be Fitted with Machine Guns

The Shenandoah is to be fitted to carry ten machine guns; two in the forward and two in the after cars, two mounted on the top of the dirigible and one each in each of the power cars.

During the week beginning Aug. 10, the Patoka and Shenandoah will carry out towing experiments in rough and smooth water. During these experiments the Shenandoah will be moored to the mooring mast on the Patoka and will be towed by that vessel to determine the feasibility of carrying the airship, moored, under various conditions met at sea. At the same time, experiments will be made to test the feasibility of refueling the Shenandoah at sea.

The same week, the radio compass calibration of the Shenandoah will be completed.

During the week beginning Aug. 17, the Shenandoah will continue her gunnery training, and the experiments scheduled for the previous weeks which may not have been completed. She will carry out machine gun experiments.

During the performance of the above schedule the Patoka will base at Newport, R. I., and the Shenandoah will base on the Patoka and at Lakehurst.

Although the detailed itinerary of the Shenandoah to the middle west has not been approved, the Shenandoah will visit Detroit, Minneapolis, St. Paul and Des Moines.

Navy Air Orders

Lt. William J. Dean det. Sctg. Plane Sqdn. 1, Aircraft Sqds., Sctg. Flt., to Nav. Airef., Fact., Philadelphia.

Lt. Ralph H. Howard det. Nav. Air Sta., Anacostia, to Airef. Sqds., Sctg. Flt., Sctg. Plane Sqdn. 1.

Lt. Comdr. Samuel J. Ziegler det. Nav. Airef. Fact., Navy Yard, Philadelphia, to Bu. Aero.

Ch. Bosn. Harry W. Weinburg det. U.S.S. Antares to Nav. Air Sta., N.O.B., Hampton Roads, Va.

Lt. Vernon F. Grant det. Nav. Air. Sta., Pensacola, to U.S.S. Langley.

Lt. George A. Ott det. Nav. Air Sta., Pensacola, to Airef. Sqdn., Asiatic Flt.

Lt. Thomas D. Guinn det. Nav. Air Sta., N.O.B., Hampton Rds., to Airef. Sqdns., Sctg. Flt.

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Publisher's News Letter

The appearance of the seventh annual edition of the Aircraft Year Book should give those interested in the development of aeronautics in this country great satisfaction. It is also very appropriate at this time to extend congratulations to the Aeronautical Chamber of Commerce under whose auspices the material published in the book is gathered. Ever since the first volume was issued, The Aircraft Year Book has been the most authoritative compendium on aviation in the United States. It has given the facts of the progressive development of aircraft so clearly and attractively that the new volumes are looked for by an ever widening circle of readers.

* * * *

The review of the year 1924, coming as it does, so late in 1925 loses a part of its value as a yearly record inasmuch as a greater part of the book is concerned with the happenings in 1925. While this makes the book much more timely and interesting it will confuse those who look at the date on the book and not at the date of publication. Very properly, the editors praise the aeronautical engineering development of 1924 as indicated by the world's records held by the United States. It is admitted, however, that the principal records for speed, duration and altitude passed out of the country in 1924. The growth of commercial aviation, particularly in 1925, is stressed with due emphasis.

* * * *

To a greater extent than usual, policies, both national and industrial are considered. The Lampert Committee investigation which conducted its main hearings in 1925 is treated with an eye to the findings in the report that the Committee will make to Congress in December. The work of the Special Committee of the Aircraft Industry that has solved some of the most difficult of the problems that have disturbed the relations of the government to the industry is given fully. While these proceedings may be of interest to comparatively few people, their far reaching effect to the development of the aircraft industry will be most significant.

As usual, the Air Mail is treated exhaustively and with an excellent appreciation of the splendid progress made during both 1924 and 1925. The newest, and for that reason, the most interesting part of the new book is that part devoted to the development of aerial photography and surveying. The broad field covered by the Fairchild group of companies is reviewed with a very keen understanding of this newly developed field.

* * * *

The decline of the passenger carrying use of aircraft is clearly indicated by the decrease of the number of fixed base operating companies reporting, the aircraft in use, and the number of miles flown. Offsetting this are the Ford and N.A.T. plans and the Huff Daland dusting operations.

As a matter of record the facts concerning the Round-the-World Flight will be valuable but it is appearing too late to have a timely interest. The airship work of the Navy and the Goodyear Zeppelin plans and operations are given in detail, particularly the cruises of the Shenandoah and Los Angeles.

The review of aeronautics throughout the world by countries is as usual one of the most valuable compilations in the book. The essential facts about the progress during 1924 in each country is given and in a comparatively few pages a birds-eye view of the aeronautical situation throughout the world passes before the appreciative reader. The chronologies and the technical portion of the annual are, as usual, excellent records of the year's achievement and happenings. As a reference book, The Aircraft Year Book has become an indispensible adjunct to every desk where aeronautical work is being done.

* * * *

There have been started a number of new promotion plans of new aeronautical companies. Some unauthorized persons are making claims that are beyond the facts and using figures that are plain mis-statements. It would be helpful if any such promotion material could be sent to AVIATION for investigation. The great danger ahead of commercial flying is from promotions based on the recent optimistic press reports of the Ford Airline and the National Air Transport. If any of our readers have any statements made to them concerning the possibilities of such lines we will be glad to investigate the proposition and give any information that can be learned.—L D G.

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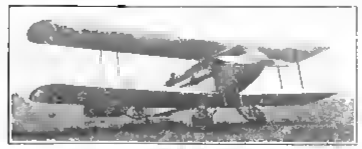

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Let the Operator Keep Faith with the Public

The public demand for the transportation of passengers, mails and express matter by the air route places a definite responsibility upon all those who are studying the problem of air operation.

There seems to be no question that companies now organized will receive the sympathetic support of the public in exact proportion to the judgment, experience and honesty which they exercise in their pioneer operations. The greatest care must be used in organizing along practical and conservative lines The success or failure of this enterprise will depend largely on two factors, personnel and equipment.

PERSONNEL. The personnel will be found available among that group of airmen produced by the war who are devoting their lives to the application of aviation to civilian needs.

EQUIPMENT. Obviously the Aircraft Operating Companies, not themselves designers or builders, must select their equipment from the best which the aircraft industry can supply.

The Curtiss Aeroplane & Motor Company, the oldest airplane and motor producer in the country, and the organization that has been the creative and productive source of the best military airplanes and motors, has directed its creative energy toward the commercial problem. It was the first company to design, build and test an airplane for the specific requirements of the Air Mail Service. The Curtiss Carrier Pigeon was at once accepted by the Post Office. The expert committee of the National Air Transport, Inc., after a coast-to-coast survey of available equipment, recommended the Curtiss Carrier Pigeon, and the company at once placed an order for a quantity of these machines.

As interchangeability of parts with consequent reduction in cost of maintenance was an important factor in the selection of the Carrier Pigeon by one company, so standardization of airplanes of one type and of one manufacturer by the Post Office and the leading operating companies will make efficient and economical operation possible. The use by all pilots of one type, the standardization of interchangeable spare parts for general distribution from Curtiss stores throughout the country, and the reduced price of planes and parts through centralized quantity production will make the Carrier Pigeon the standard commercial airplane. For "feeder lines" the Curtiss Lark, a smaller prototype of the Pigeon, will shortly be available.

CURTISS AEROPLANE & MOTOR COMPANY, INC.

GARDEN CITY, N. Y. BUFFALO, N. Y.